FREE PUBLIC LIBRARY
JACKSONVILLE, FLORIDA

The Citrus Industry
EXCLUSIVE SPECIALIZED CITRUS PUBLICATION
Issued Monthly
Representative of every interest
Representing no special interest

Publication office at Bartow, Florida. Entered as second class matter February 16th, 1920, at the post office at Tampa, Florida, under the act of March 3, 1879. Entered as second class matter June 19, 1933, at the post office at Bartow Florida, under act of March 3, 1879.

Factors In Diagnosing Citrus Grove Conditions

By Dr. A. F. Camp
HORTICULTURIST IN CHARGE CITRUS EXPERIMENT STATION, LAKE, ALFRED

At Meeting Of Florida Horticultural Society

The writer has been requested to present a practical discussion of the factors involved in diagnosing grove conditions in the light of present technical knowledge. This paper will be, therefore, only as technical as it is absolutely necessary to make it but at the same time it will be based on technical work that has been presented here and elsewhere by the various research workers. It will be a modest attempt to correlate the research work in the fields of plant physiology and soils with practical horticulture.

In examining a grove to determine what should be done in the way of fertilization or other treatments, three phases of the problem must be carefully considered: First, the history of the grove as to variety, rootstock, cropping, fertilization, etc., to form a background for the examination of it in its present state; Second, the present condition of the trees and crop in regard to symptoms of deficiencies, size of crop, quality, and general condition; Third, the soil type and reaction (pH). No judgment as to grove needs can be even reasonably accurate unless all three of these things are carefully considered and weighed.

1. History. Unfortunately the history of the grove is usually the subject on which the least accurate information is available. While a few growers can detail accurately the fertilizer treatment and the production for the previous year, very few can give accurate information on its history prior to that, and yet grove conditions are more frequently than not a reflection of the treatments of three to five years previously rather than a reflection of recent treatments. Records for at least three years are indispensible in any satisfactory attempt to evaluate grove conditions, and should record, in addition to information on variety, rootstock, and age, whether the grove is improving or declining and what deficiency symptoms have appeared, production records with an indication as to the amounts of the various grades, and detail of the fertilizer treatments with reference to both amounts and types of materials. The trend of soil reaction and a history of corrective treatments such as applications of dolomite, basic slag, or lime are indispensable. Information on pest control programs is necessary and it is particularly necessary to know whether copper or zinc has been included in the spray program. Peculiarly enough many growers are not even certain as to the rootstock on which the trees are budded. A "dope sheet" on past performances is considered indispensable to the man who bets on the horses or dogs, and a "dope sheet" is just as necessary on the past performance of a grove if you are going to bet your money on the results of your treatments..

2. Present Condition. A detailed discussion of the various symptoms associated with the nutritional condition of the tree will not be presented in this paper, such information having already become available to most growers and we will, therefore, assume that you know the symptoms of the various deficiencies and toxicities and can identify them fairly accurately. Armed with this knowledge a careful inspection of the grove should give definite information as to the deficiencies that will need to be taken care of. The inspection of the grove should not consist of a ride by the grove in a car, but of a careful examination of the trees of each of the varieties in the grove with due regard to what should be looked for in the season when the grove is examined. For instance, a June examination will probably fail to reveal the symptoms of magnesium deficiency if only yellow leaves are looked for since the old bronzed leaves have shed and the new ones are still green. In addition to looking for symptoms of deficiencies note the size of the crop, moisture conditions and the general condition of the tree. **Get acquainted with your**

(Continued on page 8)

The Importance Of Organic Matter In Soils....

By F. B. Smith
PROFESSOR OF SOILS, UNIVERSITY OF FLORIDA, COLLEGE OF AGRICULTURE

The maintenance of an adequate supply of organic matter in the soil is a question of large practical importance because the crop producing power of the soil is governed to a large extent by this material. This maintenance is rendered extremely urgent by the rapid turnover of organic residues, especially under Florida conditions where large amounts are lost each year by decomposition.

At this time I would like to point out some of the beneficial effects of organic matter in soils and to show how it may be maintained practically under Florida conditions.

Everyone familiar with the management of soils knows that decomposing organic matter binds the loose sandy soils together and gives them a more coherent body; also that the stiff clays are opened up and made more porus. The body given to sands and the granulating effect produced in clays by decomposing organic matter are highly desirable qualities from the standpoint of ease of cultivating and handling these soils. Organic matter soaks up water somewhat as a sponge and thereby increases the water holding capacity of the soil. This is of large practical importance in sandy soils because they are naturally droughty and crops are frequently damaged severely by extended dry weather. The increased waterholding capacity of the soil brought about by organic matter is an important factor in the control of erosion on rolling lands because all of the water held in the soil is just that much less left to run off over the surface.

The mineral constituents contained in the organic matter upon decomposition are liberated in a readily available form for plant use and in the case of some kinds of organic matter, especially that from the leguminous plants, the amounts of calcium, magnesium, phosphorus, potassium and nitrogen may be of considerable importance. Where organic matter is applied to a soil upon which it was not grown this represents an addition of these constituents. However, the other beneficial chemical effects of organic matter on soils are far more important than the value of the mineral elements supplied. Decomposing organic matter is very finely divided and certain materials of this nature are called colloids. Colloids are highly reactive, especially organic colloids, and the colloidal function is the reactive portion of the soil. Therefore, decomposing organic matter builds up the reactive complex of the soils and this is of special importance in sandy soils because they usually contain a relatively small amount of colloids. The colloids possess the property of absorbing certain of the mineral plant food nutrients, holding them against leaching and in an available form for plant use. Thus, organic matter in the soil serves as a storehouse for the plant food constituents, releasing them as needed by the plant.

Important as these beneficial effects of organic matter appear to be, its real signifigance lies in its value as a food for the micro-organisms in the soil. The soil is a living body and needs to be fed in order to function properly. The importance of microbiological action in other soils is another story and cannot be discussed at this time. It is sufficient to say that a soil may be unproductive unless it contains a thriving population of micro-organisms in spite of the fact that it may be well supplied with the mineral plant food elements. If organic matter possessed no other merits than as a food for the micro-organisms its use could be justified on this basis alone.

If organic matter is a food for soil micro-organisms and if the micro-organisms are thrifty and well fed, is it not logical then to expect this organic matter to disappear? This fact is often little appreciated because now and then we hear someone say that it does not pay to add a green manure crop to our sandy soils because it decomposes so rapidly. It is most fortunate that this is the case because the soil is certainly sick when the organic matter does not decompose. We do not expect our livestock to do well without being well fed and we should not expect more of the soil micro-organisms.

Since organic matter disappears from the soil quite rapidly it is necessary to make rather large additions frequently. Under certain cropping systems this may present quite a difficult problem. In general, however, the organic matter content of the soil may be maintained practically by carefully conserving all crop residues and farm manure, by green manures or cover crops and artificial farm manures or composts.

Under certain conditions, crop residues constitute the most important source of organic matter. The utilization of crop residues presents a difficult problem in some cases and perhaps this explains why the practice of burning is so common. However, when properly managed, crop residues of almost any kind may be used to a good advantage in supplementing the organic matter content of the soil without serious harmful effects. Crop residues differ from green plant material in that they are practically deviod of the easily decomposable substances and unless certain precautions are taken, their use may result in a bad case of indigestion for the soil. Such materials should be incorporated with the soil well in advance of the planting of the next crop to allow thorough decomposition, particularly if the crop to be planted is a rapidly growing type. Under such conditions it may be necessary to apply nitrogen to bring about a more rapid decomposition, especially if the soil is low in nitrogen.

Farm manure constitutes the most important by-product of the farm and it should be carefully conserved. However, there is not enough farm manure produced to maintain the organic matter content of the soil even on the livestock farms where all of the crops are produced for food.

Through the judicious use of green manures and cover crops, the organic matter content of cultivated soils may be more nearly maintained than by any other single practice. One or two tons of dry matter and four to six tons of water per acre may be applied to the soil by plowing under one crop of a green manure and if the crop is an inoculated legume, considerable quantities of nitrogen may also be added. There are some who still believe that cover crops of native grasses and weeds are just as good as leguminous cover crops. They discount the value of the nitrogen added by an inoculated legume and forget the fact that the

(Continued on page 19)

FREE PUBLIC LIBRARY
JACKSONVILLE, FLORIDA

DISTRIBUTION OF FLORIDA CITRUS CROPS

(Continued from page 3)

stomach and individual taste preferences. The United States Department of Labor reports that the median family income in the U. S. is $1295. These families purchase 34% of the foodstuffs sold in this country and can afford only 75 cents worth of oranges per year. Thus we see one-third of our market almost entirely eliminated because of the inability to buy. Now come the limitations of the stomach. People can eat only so much food and the more money available for food purchases, the wider the variety eaten. Finally come taste preferences. Many homes drink orange juice or eat grapefruit with great regularity. But there are many many more who also use tomato juice, pineapple juice, prunes and prune juice, grape juice and other fresh and canned fruits. In our clinical research work on fresh grapefruit at the great New York Hospital this season we were confronted with the fact that while patients readily accepted orange juice, they refused to accept fresh grapefruit or grapefruit juice more than twice a week. This would seem to bear out the contention of many of us that the taste for grapefruit is an acquired one. It is also interesting to note that the sweet, insiped flavor of Texas grapefruit seems to meet a more ready acceptance in undeveloped markets. By the same token, however, it is my firm belief that as the taste for grapefruit becomes more widespread, many consumers will turn to Florida varieties.

Thus we find ourselves in competition with thousands of food producers and processors, many of them spending millions in highpowered advertising, for our share of the consumer's dollar, our share of his stomach capacity and our share of his taste preference. How can we get our share, at the same time taking a profit for ourselves? First, by a clear comprehension of those things that motivate humans; their interests, desires, aspirations. This understanding is interpreted and exploited through advertising, sales promotion and publicity. Second, by a full appreciation for the problems and functions of the various trade factors, never forgetting that the profit motive is uppermost in all fields of endeavor. These we interpret in the manner in which we produce and prepare our fruit for market, in our business relations with the trade and our appreciation for the necessary functions they perform.

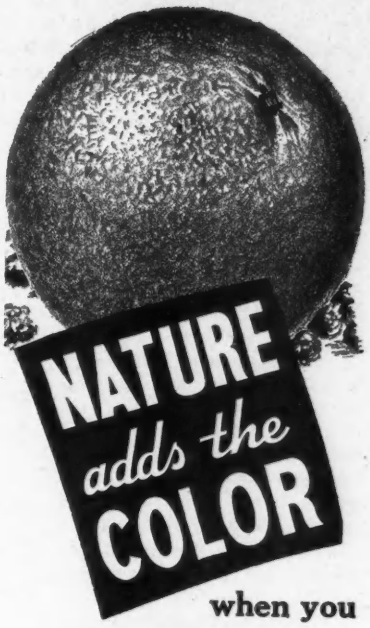
What is the strategy behind the Citrus Commission's advertising campaign? First, let me point out that the less than one million dollar fund for advertising has to be divided over four products, oranges, fresh grapefruit, tangerines and canned products, each having its individual problems and requiring distinctive treatment. Let us discuss then one by one.

Repeated consumer surveys prove that about 95% of all orange users consume them in the form of juice. There are, of course, other supplementary uses, but juice is outstanding and therefore represents our major market. All of our orange advertising is directed toward this appeal. Current advertisements feature this spelling, "FLORIDA ORANJES" with the brief explanation, "That J stands for Juicier." This little trick has created a great amount of comment among the trade and consumers. Other appeals such as health, flavor, vitamins, etc., are used, but only in a supplementary way, because to use them as a major appeal, thereby lessening the impact of the juice appeal, would be to run counter to existing consumer buying habits. Newspapers, Sunday newspaper supplements, outdoor posters and car cards in major markets are used in this campaign. The Commission is more than gratified at the results of the orange campaign to date. Consumer recognition of the superior qualities of Florida oranges is rapidly increasing as evidenced by the recapturing of many mid-western markets and the consternation of California's Navel growers.

The California Fruit Growers Exchange has spent over $25,000,000 in the last quarter century advertising oranges and lemons and to them is due much of the credit for the ready-market that now exists for Florida oranges. But such is the penalty of leadership. In respect to grapefruit, the situation is reversed and Florida finds itself suffering this same penalty of leadership. Upon Florida, the leader, has rested the responsibility of creating new uses and expanding old ones, of increasing consumer demand for all grapefruit, of doing an educational job, so to speak. And then almost overnight, another producing area mushrooms into tremendous production, thus increasing the supply far beyond the markets' capacity to consume.

The Commission's grapefruit advertising for the first two seasons was directed towards increasing the market for this fruit, swinging over to a more competitive type of cam-

(Continued on page 15)



when you
SPRAY
With TC Brand
TENNESSEE CORPORATION

65%
MANGANESE
SULPHATE

or Specify Tee-Cee Brand 65% Manganese Sulphate in Your Regular Fertilizer

Authorities agree that Manganese is a factor in maturing fruit with a deeper NATURAL COLOR inside and out—and with increased sugar and solids. So get better-colored fruit the NATURAL way—spray your trees with Tee-Cee Brand special "bone dry" 65% Manganese Sulphate, or include this valuable mineral corrective in your regular fertilizer.

Tee-Cee Brand 65% Manganese Sulphate is the most economical form of manganese to use—because it analyzes high percentages of Sulphates of COPPER, ZINC, IRON, MAGNESIUM and CALCIUM in water soluble form. These extra elements provide additional plant foods for your trees, at no extra cost.

See your local fertilizer dealer, or write for more information.

DISTRIBUTED BY

U. S. Phosphoric Products Corp.
TAMPA, FLORIDA

- 53% Tri-Basic Copper Sulphate
- 39% Zinc Sulphate
- Copper Sulphate

FACTORS IN DIAGNOSING CITRUS GROVE CONDITIONS

(Continued from page 5)

grove.

3. The Soil. We will devote a little more time to the subject of the soil as it is probably less well understood. Soil research has not been put into very practical terms from the layman's viewpoint as yet and much of the information is too technical for him to use. Consider first the soil itself. Is it a sand such as is characteristic of the Ridge and many of the other citrus areas, and if so, is it a very light sand, low in organic matter, in other words Blackjack land? Or is it heavier and darker because of more organic matter and originally producing a growth of pine or turkey oak. If not a sand, is it marl soil or a heavy hammock soil or is it a flatwood soil that is likely to become waterlogged in summer? If it is a sand, how close is clay to the top and if a poorly drained soil, how stable is the water table? All of these things will influence the decisions that you will have to make regarding its treatment.

Having considered the type, we come to the question of reaction or pH. This subject has been about as badly maltreated as any subject connected with grove maintenance in Florida. Every one you meet is determining or having determined the pH of his soil and only a few understand the application of the results. pH is a measurement of the active acidity of the soil as you have been told repeatedly, but it is considerably more than that for it is a measurment of the present fertility level in the soil. To explain the use of pH it will have to be pointed out that each soil has a characteristic ability to absorb such bases as calcium, potassium, magnesium, etc., i. e., it has a certain exchange capacity. In Florida soils this ability or capacity is a function of the organic matter while in northern soils it is mainly a function of the inorganic clays. All of this simply means that any particular grove soil has a definite capacity for holding plant nutritients such as calcium, potassium, manganese, magnesium, etc., in a form that is fairly available to the plant. In addition it may hold hydrogen which goes to make acidity of which pH is a measure. The pH therefore, becomes an indicator of the extent to which the capacity of the soil is filled with plant nutritients or with hydrogen which is of little or no value to the plant. Thus if the pH of your grove soil is 4.5, it has only about 20 percent of its potential capacity saturated with nutrients and the remainder is saturated with hydrogen, but if the pH of your soil is 6.0 about 80 per cent of the capacity is saturated with bases and only 20 per cent with hydrogen. Thus, if your soil has a pH of 4.5, it is holding available to the tree only about one fourth as much of the plant nutrients as if the soil reaction was pH 6.0; in other words, at pH 4.5 your grove cupboard is about 80 per cent filled with something the trees cannot use. This relationship has a far reaching effect on the question of fertilization due to the fact that when you add such things as potassium or magnesium they can readily replace the calcium on the colloidal particles of organic matter and themselves become absorbed or held in the organic matter while they have great difficulty in replacing hydrogen. Thus, if your grove soil has a reaction of pH 4.5 and you add to it muriate of potash, a large proportion of the potassium which the tree needs for its future use will be lost by leaching because there is little calcium absorbed in the organic matter and a great deal of hydrogen which resists strongly the absorption of the potassium by the organic matter. Fertilization with the ordinary plant nutrients on such soils is wasteful because a great deal of that supplied in fertilization is lost by leaching, and the tree has only a short period in which it may absorb the added elements. Now if we have the same soil with the pH raised to about 6.0, there is a great deal of calcium in the organic matter and when muriate or sulfate of potash is added a considerable proportion of the potassium replaces the calcium in the organic matter and remains available to the tree for future use. In this latter case the tree has a much longer period in which the added fertilizer can be taken up and used and less of it is lost by leaching. In plain language it takes less fertilizer to accomplish the same results at the higher pH since at the lower pH you give the tree a little and throw the rest away while at the higher pH you give the tree a little and put most of the remainder in the cupboard for future use. If the pH of the soil were raised to around 8.0, it would be completely saturated with bases, but the maintenance of such a pH entails problems of fixation which offset the small advantage that may be gained by raising it from pH 6.0 to 8.0.

Considering first, by way of an example, a sandy soil that has a pH in the range of 4.5 to 5.25, we have a soil that is very acid, and that has only 20 to 30 per cent of its potential holding capacity saturated with bases. In such a soil, bases such as calcium, magnesium, potassium, manganese, zinc, and copper, will be present in minimum amounts. If one of these has been applied recently it may be temporarily high but will rapidly decline due to leaching. You do not need a soil analysis to tell you that such nutrients are low because the pH will tell you that. Further than that the low pH means that if soluble salts, such as sulfate of potash, are applied the leaching will be excessive since only a small amount of the base will be absorbed by the organic matter.

Considering next sandy soils with a pH between 5.5 and 6.0, the range which is ordinarily recommended for sandy soils for citrus, we have a soil that is 70 to 80 per cent saturated with bases which the plant can use. Calcium and potash at least will be reasonably high and the same will be true of magnesium, copper, and other bases if they have been applied in amounts sufficient to meet the needs of the trees. When soluble salts are applied to such a soil a large proportion of that applied will be retained by the soil for future needs, all of this being based upon the assumption that the pH has been in this range for some time.

Consider now a soil with a pH between 6.0 and 7.0. In this range zinc becomes largely unavailable and is present in the available form in insufficient amounts for average plant needs. The soil is well saturated with bases and calcium in particular will be high and such other bases as have been applied will be high also, but the shortage of zinc will probably prevent the trees from utilizing them properly — in other words the grove will be frenched. Such a pH on a sandy soil usually means it has been overlimed with high calcic limestone since dolomite seldom raises the pH above 6.0.

Finally, we consider the soils that have a pH between 7.0 and 8.0. These soils are usually soils containing a good deal of marl but may be overlimed sands. In this range of pH both manganese and zinc are fixed and there is some evidence that copper may also be fixed if the pH is close to 8.0. If it is a marl soil it will probably have plenty of magnesium, but if it is a sandy soil that has been overlimed with high calcic lime it may be short of magnesium but through failure to apply it rather than thru

(Continued on page 20)

Control Measures For Mealybugs

By J. R. Watson
ENTOMOLOGIST, FLORIDA EXPERIMENT STATION

Mealybugs occasionally, from now until July when the weather is warm and dry, get abundant enough on citrus trees, and especially grapefruit, to demand control measures. They have a habit of congregating in bunches of grapefruit, where they give off a copious amount of honey dew which blackens up the fruit through the development of sooty mold. Also well known are the bumps caused on such fruit and the fact that it ripens unevenly, some parts of the fruit being green where the other part is yellow, Furthermore, if the infestation gets sufficiently severe the fruit may drop.

But there is another situation which is peculiar to mealybugs which is more commonly overlooked by our citrus growers. This is under the calyx of the young fruit, particularly at this time of the year. In such situations the mealybugs are not easily seen and may get quite numerous and still entirely escape the notice of the grower. If sufficiently numerous in such situations they will cause the young fruit to turn yellow and drop off. If the citrus growers are having a heavy dropping of young fruit, particularly grapefruit, it would be well for them to examine the calyx cup from which this fruit has recentlly fallen, or, better yet, any yellow fruit, and look in the cup of the calyx. This is where you will find the mealybugs. Of course, not all dropping by any means is due to mealybugs; the fact is the proportion due to this cause is small. Much drop is due to too heavy crop for the trees to carry and should on the whole be considered beneficial to the tree and to the crop. But if mealybugs are common in this situation, they may cause an excessive dropping and a serious shortening of the crop.

Mealybugs are rather difficult things to control by spraying, particularly those that get under the calyx of the fruit. It is very difficult indeed to force a spray under the calyx. It is also difficult to thoroughly wet a large mass of mealybugs congregated in a cluster of the fruit. The best spray we have ever found to kill mealybugs is a commercial compound known as Lethane. When this compound is combined with a companion substance known as Lethane Spreader is has given a good kill of all mealybugs which it hits. Lethane has also been combined with a light oil as a spreader, giving good control not only of mealybugs but of purple mites and young scale crawlers. Lethane, however, is a somewhat expensive spray.

It is often possible to apply a combination spray for mealybugs and some other pests. At this time of the year rust mites often need attention. For these the standard spray is lime-sulfur. In the last few years it has become an almost universal practice to add to the lime-sulfur wettable sulfur. This enables one to cut down the amount of lime-sulfur in the spray and at the same time it acts as an excellent spreader, as well as adding materially to the amount of sulfur in the spray. At this time of the year lime-sulfur can be used in the proportion of 1 to 65; that is to say, 1 gallon of the commercial lime-sulfur to 65 gallons of water. To each 100 gallons of this spray add from 5 to 10 pounds of wettable sulfur. This makes a safer spray than a higher concentration of lime-sulfur with the wettable sulfur.

To control mealybugs by this spray one will have to use strong pressure. You have seen how thoroughly the mealybugs are protected under the calyx of the fruit, and strong pressure is necessary to force the spray into these situations. After the grapefruit get larger mealybugs have the habit of concentrating in bunches on the fruit, in the angles and crevices the grapefruit make where they touch each other. In this situation also they are hard to reach and a strong pressure will be necessary.

If there are but few rust mites in the grove but there are many scale insects, perhaps the most feasible spray for mealybugs and scale insects would be an oil emulsion. But one has to be careful in the application of an oil emulsion, as they may burn the young and tender fruit. Perhaps it would be best to confine the spray at this season to an emulsion made out of one of the more highly refined oils, the so-called "white oils," of which there are several on the market. Also, avoid spraying in the middle of the day when the temperature comes up to 90 degrees F. or above. What we have said about strong pressure in the application of lime-sulfur applies also to an oil emulsion.

Several years ago the experiment station introduced from California a ladybeetle known as Cryptolaemus, which originally came from Australia. These ladybeetles were for a number of years raised by the Experiment Station and sent out to growers, but several years ago a commercial firm in Orlando undertook to propogate these beetles and it was discontinued by the Experiment Station. In several instances these beetles have survived the winter in these groves and have been found there in the spring, but only in small numbers and as a general thing it is necessary to reintroduce them into the grove each spring. This has also been found necessary in California where the Cryptolaemus beetles have been much used, more extensively than in Florida.

Another important point in attempting to control mealybugs by the use of Cryptolaemus is that it must be introduced into the grove early in the infestation. To bring under control a heavy infestation once it has gotten started would require an immense number of beetles and would be impracticable. Cryptolaemus should be introduced when mealybugs are first noticed in the grove. In other words, they should be used to prevent a heavy infestation from developing rather than to bring one under control that has already gotten started.

The Experiment Station has secured from California another parasite of mealybugs and we are now raising it in the laboratory. This is a tiny wasp-like insect and in California it has given even better control of mealybugs than Cryptolaemus. We are hoping that we can get it established in Florida and that it will be as effective here as in California. The Experiment Station hopes to have a small number of these to send out soon. In case any of our readers has a heavy infestation of mealybugs soon it would be well for him to get in touch with his County agent as these parasites will be distributed through the County Agents.

After the rainy season of the summer gets well under way an epi-

(Continued on page 21)

The Citrus Industry

with which is merged The Citrus Leaf
Exclusive publication of the Citrus Growers and Shippers

Publication office 550 North Broadway, Bartow, Florida
Telephone ____ 269

Published Monthly by
ASSOCIATED PUBLICATIONS CORPORATION
S. L. FRISBIE - - - - - - - - President
S. LLOYD FRISBIE - - - - - - Secretary-Treasurer
A. G. MANN - - - - - - - Production Manager

Subscription, $1.00 per year in advance

CITRUS LEGISLATION

Until Friday, May 26, Florida citrus growers had gotten about everything they had asked of the Florida legislature now in session. Ten non-controversial bills asked by growers' organizations were passed with practical unanimity. In addition, the lower house had acted favorably upon some other bills advocated by the grower organizations but which had been opposed in other quarters.

On May 26, however, the senate defeated a bill which previously had secured favorable action in the house which would have provided for a state marketing agreement supplementing the federal marketing agreement, and which would have established state control of intra-state shipments of citrus fruits and the sale of fruits to canners. The senate vote resulted in a tie—17 to 17—which automatically killed the bill. Doubtless the defeat of this measure was due to the fact that the growers themselves appeared to be divided as to its merits. Arguments were advanced by opponents that its enactment would "put the cash buyers out of business" and that it "would operate against the small growers." Proponents on the other hand declared that the bill would save the growers from a "devil-take-the-hindmost policy" when there is no regulation.

Taken all in all, the legislation enacted by the present legislature appears to have established a citrus code which may really accomplish something for the citrus growers. With the exception of the state marketing control agreement, the growers appear to have gotten everything they asked for. If they did not get what they wanted, the blame cannot properly be placed upon the legislature.

But the enactment of these laws is only the first step in the march toward grower prosperity. The succeeding steps are in the hands of the growers themselves. Having formulated these bills and steered them through the legislative hopper, they must co-operate fully and promptly with enforcement officials in seeing that the provisions of the bills are meticulously carried out. There must be no toleration of evasion or attempts at evasion and no let-down in grower vigilance if maximum benefits are to be achieved.

Nor should there be any lessening of grower interest in the problems common to all growers. If practical application of the legislation enacted at grower demand should demonstrate that anything has been overlooked or that modification seems advisable, the growers should be prepared to present a united front in demanding such additions or modifications at the next session of the legislature.

After all, the growers' problems are going to be solved, if solved at all, by the growers themselves.

GRAPEFRUIT IN PRISON CAMPS

We do not usually look to prison camps for lessons in health or dietary tactics. Yet, according to Arthur B. Hale, chairman of the Florida State Highway Board, we might well turn our attention in that direction.

Mr. Hale recently announced the results of a two-year experiment in the use of grapefruit in the state's prison camps. According to Mr. Hale, there have been no epidemics of sickness in the 32 prison camps of the state during the two-year period; all types of illness have been greatly reduced, cutting medical costs; colds have been curbed and those who became affected responded quickly to simple treatment. Mr. Hale further states that the use of the fruit more than paid for itself by increasing the average productive period of each convict 162.16 hours. This was formerly lost while prisoners were incapacitated by illness.

Suggesting a still greater use of grapefruit in prison camps, Mr. Hale says: "The use of Florida grapefruit in Northern prison camps would seem to be even more important because our winters are not rigorous. Where several months of wet, sloppy weather occur each winter, the addition of grapefruit to the prison diet should be reflected in lower medical needs."

In the Florida prison camps each prisoner is given a half grapefruit or an eight ounce glass of grapefruit juice twice daily.

Certainly this is an experiment which has abundantly proved its success and one which is worthy of emulation in other states.

The grove which isn't worth protecting isn't worth having. Even in a year of low prices and financial loss it pays to provide sufficient plant food and to protect your trees from bugs and other pests. A mule cannot long work without food nor a tractor without fuel. Neither can a neglected grove produce an abundant crop of superior fruit.

Without an exceptionally heavy "June" bloom, Florida grapefruit growers will have no occasion to worry about a surplus crop this season.

After a protracted drouth nature has at last taken over the job of grove irrigation.

FREE PUBLIC LIBRARY JACKSONVILLE, FLORIDA

Further Light On The Nature And Cause Of Psorosis Of Citrus Trees

By Arthur S. Rhoads
PLANT PATHOLOGIST, COCOA LABORATORY
FLORIDA AGRICULTURAL EXPERIMENT STATION

Psorosis has been regarded as one of the more important and destructive diseases of citrus trees in both Florida and California for a considerable number of years, records of it dating back to the 1890's in both states. This disease was first described briefly from Florida by Swingle and Webber (6) in 1896. Some Florida growers have expressed the belief that psorosis first appeared in Florida after the freezes of 1894-95 in groves rebudded from budwood sent from California. However, this belief is erroneous. Since the letter transmitting Swingle and Webber's bulletin to the chief of the Division of Vegetable Physiology and Pathology of the U. S. Department of Agriculture was dated April 11, 1895, their manuscript probably was written some months before. In any event, Fawcett (1) quotes Webber as remembering having seen psorosis first in Florida in the vicinity of Eustis before these freezes. Psorosis is widely distributed in the Orient and it has been suggested by Lee (5) that, although first attracting attention in Florida and California, it was spread to some of the other citrus-growing countries with the spread of **Citrus** varieties and species. This disease is now known to occur in most of the citrus-producing countries of the world.

The cause of psorosis has remained a mystery until recently, since it has not been possible to isolate a casual organism. However, Fawcett, on the basis of work for a number of years in California and observations in other countries, has demonstrated quite conclusively that it is a virus disease. Virus diseases are very common among plants and as examples of well known ones may be mentioned yellows, little peach, rosette and mosaic of peach, and various mosaics of potato, raspberry, sugar cane, tobacco, tomato, and numerous other plants. A virus is considered to be an infectious principle of undetermined nature, known by its effects and readily transmissible from diseased to healthy plants, but beyond the range of present day microscopic vision. Recently there has been isolated from mosaic-infeceted tissues of tobacco, tomato and other plants a crystalline protein having the properties of the viruses of these respective plant mosaics and capable of producing them when injected into healthy plants. A virus may invade only certain parts or local regions of a plant, in which case it is said to be localized, or it may pass to all parts, in which case it is said to be systemic. Virus diseases are usually transmitted by means of sucking insects which serve as carriers or vectors through feeding on diseased plants and then on healthy ones.

Fawcett (1, 2, 3,) has succeeded in transmitting psorosis from diseased to healthy citrus trees by means of buds, bark grafts and root grafts. Bark grafts of the type of the disease known as psorosis A in California, made in 1933 on 11-year-old healthy trees induced the beginning of bark scaling in less than 5 years. Buds from diseased trees placed in large limbs of healthy trees in 1933 resulted in bark symptoms from psorosis A (the most common type) in 5 years, but in bark symptoms from psorosis B (the more virulent but occasional type) in 15 months. Of the various methods of transmission tried by Fawcett, only the fusion of live cells of the diseased buds, bark grafts and root grafts with those of healthy plants yielded successful results. So far, no mechanical or other means, such as injection of juices, rubbing, or the use of extracts of any kind have succeeded in transmitting psorosis. A number of citrus insects, such as aphids, mealybugs, and some of the scale insects have been tried, without producing any transmission.

The writer has also succeeded recently in transmitting the characteristic bark symptoms of psorosis, in Florida, after the lapse of about 3 years, thus confirming Fawcett's work in this respect. This was done by grafting patches of bark ¾ of an inch square from an active psorosis lesion on an orange tree into the upper limbs of a few large healthy orange trees. In the few successful instances, however, the lesions developing made very little advance by the end of the fourth year.

Fawcett (1) has also reported a mosaic effect on the young, rapidly growing leaves, which is consistently associated with the previously known bark symptoms, and which may show up long before the appearance of the latter. This is a very fleeting symptom, however, and usually ceases to be apparent as the leaves grow older. He likewise has reported symptoms of psorosis on the fruit, but apparently these are rare. The recognition by Fawcett in 1933 of symptoms of psorosis on the foliage provided a means of identifying certain species of citrus with apparently sound bark as carriers of the virus. Many such carriers have been found to be considerably more tolerant of the virus principle than those showing bark symptoms, such as sweet orange and grapefruit (2). To prove that both the bark symptoms and the leaf symptoms are manifestations of the same disease, Fawcett has produced bark symptoms by the use of buds near leaves that had leaf symptoms, and has produced leaf symptoms with bark that had psorosis symptoms.

Fawcett and Klotz (4) recognize two types of psorosis in California, both inducing similar bark symptoms, but differing in other respects. These are designated as psorosis A and psorosis B. Considerable variation occurs in the manner and severity of development of psorosis in Florida, indicating that there may be two or three types of the disease here. In the usual type bark lesions develop on the main trunks and bases of the main limbs, without the development of independent lesions on the upper limbs. Less frequent is the type where isolated lesions appear on the upper limbs after, or simultaneously with, the development of the disease on the trunks and bases of the main limbs. A third and rather rare type of psorosis is found in which a series of pimply to finely scaly lesions gradually coalesce to involve practically the entire bark of the trunk and most of the larger limbs, giving trees thus affected much the appearance of a severe case of

apple measles: In the first-mentioned type the disease appears to be localized, but in the last two it obviously becomes systemic and involves the entire tree. Only in very rare cases do psorosis lesions occur on the upper branches of trees in Florida without first developing on the trunks or bases of the main limbs.

The principal means of spread of psorosis appears to be through budding from diseased trees rather than by disemmination from tree to tree in the grove. As Fawcett (3) has pointed out, it is possible that some spread may occur occasionally as a result of natural root grafting between trees in the grove, since artificial root grafting in the nursery has resulted in the disease passing from diseased to healthy trees. In California a number of orchards or parts of them have been traced back to individual parent trees or groups of parent trees that were used for propagation. Fawcett (3) reports that in almost every case where an individual tree had furnished the buds for a set of nursery trees, these have remained free from the disease, provided the tree was free from bark or leaf symptoms, but have all become diseased in case the parent tree was diseased. A striking example cited by him is at the Citrus Experiment station at Riverside, where two blocks of trees, each propagated from a single parent tree that is disease-free, have remained free from psorosis while a third block purposely budded for experimental purposes from diseased parent trees is 100 per cent infected with psorosis. Another striking example is a Valencia orchard in Orange county with approximately 100 per cent of the trees showing psorosis on the bark. Five orchards were budded from this one when the trees were too young to show bark symptoms. The trees in all five of these orchards are now approaching 100 percent psorosis. A sixth orchard was budded from one of the five daughter orchards. This orchard, at 14 years of age, has 60 per cent of the trees with bark scaling and probably 100 percent showing symptoms in the leaves. Still another striking example is a block of Valencia oranges in Ventura county known to have originated from a diseased parent. This block shows 97 percent of the trees with psorosis on the bark and 100 per cent with leaf symptoms. Another block next to this one, the buds for which originated from a healthy parent tree, has no psorosis, even on the row next to the diseased block.

No particular evidence has been gathered to indicate that psorosis spreads in groves from diseased to healthy trees. A survey made in a block of grove at Lake Wales, Florida, in 1936, following a previous survey of the occurrence and distribution of psorosis first made in 1927, showed that the new cases of this disease which developed during the 9-year interval between the two surveys occurred sporadically, with no particular tendency to be concentrated about the trees first developing the disease. A subsequent survey of this grove and of others at Mountain Lake, where a large percentage of some plantings have developed psorosis in past years, indicates that this disease is much less prevalent than in former years. This appears to be due solely to the fact that most of the virus-infected trees that were destined to develop psorosis have already done so and declined to such an extent that they have been removed and new ones set in their places. There is no evidence of any tendency for this disease to develop in trees reset where diseased trees have been removed, provided the new trees have been budded from virus-free trees. There is some evidence in Florida to indicate that methods of handling and fertilizing groves containing trees infected with the psorosis virus may either expedite or retard the development of this disease.

In view of the readiness with which psorosis may be transmitted to various species, varieties and hybrids of citrus trees through use of budwood from diseased trees having been amply demonstrated by Fawcett, it behooves those who propagate citrus trees to exercise the utmost caution to select budwood from trees of fair age which are definitely known to be free from this disease. Owing to the ability of psorosis to remain quiescent for several years before the bark symptoms develop, it is advisable not to select budwood promiscuously from young trees of unpedigreed origin, as these may be carrying the disease in a latent stage. If all commercial propagators of citrus trees would follow these precautions strictly, it is possible that this pernicious disease can be largely eradicated from the State during the next quarter century.

Literature Cited

1. Fawcett, H. S. Citrus diseases and their control, pp. 188-202. Second edition. McGraw-Hill Book Co., Inc., New York, 1936.

2. Fawcett, H. S. Transmission of psorosis of citrus. (Abstract). Phytopathology 28 (9): 669. Sept., 1938.

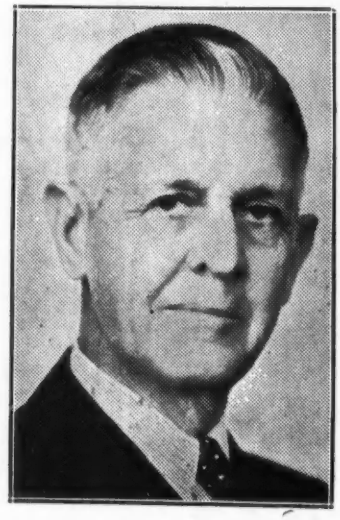
3. Fawcett, H. S. Scaly bark in relation to propagation of citrus trees. California Citograph 24 (7): 242, 262, 3 figs., May, 1939.

4. Fawcett, H. S. and Klotz, L. J. Types and symptoms of psorosis and psorosis-like diseases of citrus. (Abstract). Phytopathology 28 (9): 670 Sept., 1938.

5. Lee, H. A. California scaly bark

(Continued on page 14)

C. H. Walker Elected President Exchange



Elected April 21, 1939.

Mr. Walker was born December 24, 1871, at Haddock Station near Macon, Georgia. He came to Florida with his parents about 1883, the family settling near Trilby. They moved to Bartow two years later and this city is still Mr. Walker's official residence.

In 1908 he went with a group of leading citrus growers to California to study the operations of the California Fruit Growers Exchange. As a result of that trip and the information obtained, the Florida Citrus Exchange was organized the next year. Mr. Walker was placed on the Board of Directors, a post he has held for nearly thirty years.

In addition to this office, he has been active in many other phases of the citrus industry. For fourteen years he was manager of the Polk County Citrus Sub-Exchange. He organized and is president of the Exchange Supply Company, a cooperative buying subsidiary of the Florida Citrus Exchange. He also organized the Growers Loan & Guaranty Company, financial subsidiary, and has served as president of that organization.

In 1927 he took over the management of the groves formerly owned and operated by the Pittsburg-Florida Fruit Growers Corporation and its affiliated companies. He is head of the Florida Orange Growers Sales organization.

FREE PUBLIC LIBRARY JACKSONVILLE, FLORIDA

The Growers' Own Page

This department is devoted to the growers, for their use in giving expression to their views and a discussion of growers' problems. Any grower is welcome to make use of this department for the discussion of topics of interest. The only requirements are that the articles must be on some subject of general interest, must be reasonably short and must be free from personalities. The editor assumes no responsibility for views expressed, nor does publication imply endorsement of the conclusions presented.

STOP GREEN FRUIT SHIPMENTS

Fellsmere, Fla., May 4, 1939.
The Citrus Industry,
Bartow, Fla.,
Gentlemen:

I just wanted to tell you that I think your article in your May number, "The Effect of Drought on Trees," is the most helpful one I have read in many a long day.

Also the strong stand you have taken in regard to the shipment of unripe fruit early in the season, which has almost ruined the reputation of Florida fruit. If this practice can be stopped there is hope for us growers.

Yours very truly,
(Mrs.) J. B. BROWER

COLOR ADDED

Mascotte, Fla, May 3, 1939
Editor The Citrus Industry:

I notice in your "Growers' Own Page" May issue that two writers justify the pre-coloring, or color-added, for citrus fruits, claiming that while the fruit is green in color the fruit is really ripe, especially Parson Brown oranges, which in the early days was and still is one of our best early oranges.

With my sixty years' experience as a grower, making a specialty of early varieties — Parson Brown — as for many years all early oranges were called and branded, until in the early 1920s when pre-coloring became general and all early oranges were branded "Parson Brown" most of which was mid-season or other varieties, or green fruit, thus destroying the reputation of that fine flavored orange.

As an illustration which the records will show: As a special shipper through the Florida Citrus Exchange, season 1924-25, one of my cars was sold in Charlotte, N. C., manifest marked "Parson Brown," which it was, and stamped also "Tree Ripened, not artificially colored." This car was rejected with the complaint that "we have been stung several times by Parson Brown oranges and will not accept any more." The car was diverted to Philadelphia, sold on its merits for what it actually was at the highest market price.

On account of the deception practiced, Parson Brown as a brand died. Change to "Round Oranges" was made and used.

Previous to 1913, before pre-coloring was practiced, and only the ripened fruit was shipped, we used only common vent cars, had very little decay and fruit held up sound upon arrival, making a reasonably safe investment for the dealer and a desirable product both in appearance and flavor for the consumer.

The article by "Consumer:" As the consumers are the most important interest to satisfy, being the final judges, we the producers must give them our first and best consideration.

A R. GANO

MORE ABOUT "COLOR ADDED"

Crescent City, Fla., May 15, 1939
The Citrus Industry
Bartow, Fla.,
Dear Editor:

I have read with interest the three articles on the growers page of the May issue of The Citrus Industry and I have no small degree of appreciation for the writer who signed his name as "Consumer." I have had more than one person in the north who had never been to Florida tell me that they did not like to see oranges marked "Color-added" as it gave them the impression that such fruit must be of inferior quality or it would not be necessary to add color to it, and this is really the sum and substance of the whole thing. The ONLY purpose of "color added" is to make fruit of inferior quality appear like that of the very best and most desirable — an unfair means of getting for oneself that which rightfully belongs to another. It is deceptive and the best that can be truthfully said for it is that it is legalized fraud.

I certainly appreciate the compli-

These "VOLCK" Oil Sprays are made for GULF STATES use

FLORIDA VOLCK Oil Emulsion

VOLCK READY-MIX Emulsifiable Oil Spray

THE phytonomic mineral oil stock selected for use in "FLORIDA VOLCK" and "VOLCK READY-MIX"...

1. Has a high degree of insect-killing quality;
2. Volatilizes from the plant as rapidly as is practicable for its intended uses;
3. Is refined to the phytonomic stage that years of experience in the Gulf States have shown to offer a wide margin of commercial safety at effective dosages, and
4. Is prepared to have the mixing, wetting, spreading and depositing qualities required for Gulf States Citrus Pest control.

ORTHO SCIENTIFIC PEST CONTROL
REG. U. S. PAT. OFF.

There is no adequate substitute for a commercial dosage of "VOLCK" for a *general clean-up* of *citrus insect pests.*

● For further information, consult Nitrate Agencies Co., Jacksonville; Jackson Grain Co., Tampa; Hector Supply Co., Miami, or

CALIFORNIA SPRAY-CHEMICAL CORPORATION
ORLANDO, FLORIDA

ments that Mr. Skinner paid to the fruit that is grown in my community. I have always considered it superior to that grown in most other sections but thought it unwise to brag about it, but since Mr. Skinner has made the statement through the press I see no need of being bashful about the matter in the future. However Mr. Skinner's article as a whole is comparable to certain premature newspaper accounts of the late Mark Twain's death, about which Mark Twain wrote, "The newspaper accounts of my death are greatly exaggerated."

Mr. Skinner states that "The coloring process, as used in packing houses today, can be handled in such a way as not to damage the fruit in any manner." Perhaps it CAN be done but the fact remains that it is not done without more or less damage, and the greener and more immature the fruit the greater the damage. There are two kinds of gases used in the artificial coloring practice. First we have the gas produced from the ordinary kerosene stove by smothering it. These fumes are very strong in monoxide gas and there can be no doubt about its poisonous qualities, while ethylene gas is used more extensively now than the former kind there should not be any doubt in the minds of most people as to its poisonous qualities as both Mr. Skinner and Mr. Schell state that physicians use it as an anesthetic. If it were not a poison it would be useless for this purpose. It is not only poisonous but it is inflamable and an explosive. Maybe someone would like to deny that statement, but I know of an instance where a coloring room exploded just after receiving a normal amount of this "harmless" gas, and blew both doors off and did considerable damage to the walls of the building, and had it not been for the prompt action of the night watchman with a fire extinguisher the entire packing plant as well as some other adjacent buildings would have gone up in flames. Thanks Mr. Schell, for thinking that I am hardy enough to live indefinitely in such an atmosphere. Such gases DO INJURE THE FRUIT.

No, I do not expect Mr. Skinner nor his friends to go out of the orange business just because they are not as fortunately located as the growers at Crescent City, but I think that he might market his fruit on its own merits and not try to imitate our superior quality by the unfair use of "citrus cosmetics."

It is quite a noticeable fact that packing house employees almost without exception, when they want an orange to eat get it as it comes from the field and scorn the stuff after it goes through the coloring room. A prominent packing house operator told me just recently that seventy-five per cent of all the oranges he ate around the packing house were unprocessed as he did not care for them after they had been processed. Now if the people that ship the stuff don't like it how do you expect the consuming trade to appreciate it?

Mr. Skinner says, "we are having trouble now marketing our fruit in a marketing season nine months long. We cannot market green skinned fruit." If the fruit is left on the trees until it is RIPE it will not be green skinned. Artificial coloring of fruit does NOT lengthen the shipping season but actually shortens it. The coloring of citrus fruit is not caused by cold weather but by maturity, however, cool weather has a tendency to hasten the maturing process but the coloring process preceeds the state of full maturity.

Mr. Skinner seems to think that I have never been out of my own yard but that is just another one of his mistakes. I have visited the northern markets as well as the central and south Florida and I have been farther south than that. I have picked oranges from the trees growing in their natural state in the torrid zones in the late spring months. This fruit had as fine color as any I have ever seen, perfectly smooth in texture and unsurpassed in eating qualities. In spite of the total absence of cold weather it neither kept its green color nor "regreened." Regreening is caused principally through improper cultural practices, and NO ORANGE EVER GETS RIPE BEFORE IT COLORS.

The federal government prohibits the artificial coloring of imitation butter as well as other food products and there is no reason why the pure Food Authorities should not extend the same protection to the citrus grower and the consumers of this fruit.

I am a citrus grower of forty years experience and my father was an orange grower before me, and I know whereof I speak. I have planted the seed, budded the nursery, raised the fruit, packed it and written the bills of lading that started it on its way to market. I have been through the mill.

Yours truly
L. P. DeWOLF

COLORING AND PROCESSING CONTROL

The fact-finding survey made by The Florida Citrus Fact Finding Institution and distributed to the citrus growers and business interests of the state in phamplet form under the title "Fact Finding Concerning Florida Citrus Maturity Law" was a most damaging piece of evidence . . positive proof that fruit leaving the state in September and October is unfit to eat.

This poor merchandising practice, no doubt, is the reason for low returns to the grower. You can't abuse the consumer and trade and maintain their good will . . . without good will you cannot market a volume of any produce at a profit to the grower.

This fact-finding report when placed in the hands of the legislators, members of both houses, was most effective . . and made possible to pass Senate bill No. 194 through the Senate April 25th . . . same bill accepted by the House and passed May 4th.

This bill empowers the Florida Citrus Commission: "to promulgate and enforce rules and regulations and control the methods and practices followed or used in the packing, coloring, preparation, and processing of citrus fruits to the end that such methods and practices as affect the eating and keeping quality of citrus fruit and depreciate the value thereof, may be minimized to the greatest possible extent if not altogether eliminated."

The legislators intend that the Citrus Commission shall interpret this law as meaning the Commission has control over what constitutes a properly constructed coloring room . . . the maximum heat, humidity, and number of hours that fruit can be held in the coloring room.

As this law is not self-executing any valid order of the Florida Citrus Commission must be supported by facts introduced at a public hearing. It is up to the citrus growers as to whether this gas color control law is effective. The grower must assist the Florida Citrus Commission in obtaining facts, not opinions, at the public hearing when called by the commission on this subject.

The citrus growers of this state owe a debt of gratitude to every member of their legislative committee headed by Lou Kramer and Finnie Steed.

From my personal observation the success of the citrus growers legislative program was greatly due to the fine cooperation given by the following outstanding men: Nathan Mayo, Commissioner of Agriculture, J. J. Taylor, State Chemist, in charge of inspection, William H. Wilson, Director of Farm Markets, in the Senate, Senator J. J. Parrish, Senator Spessard L. Holland, and Senator Walter Rose—in the House, Speaker G. Pierce Wood, and the entire personnel of the house and Senate citrus committee. The outstanding member of the house Citrus committee, in point of services rendered, was Dan McCarthy of Ft. Pierce.

The citrus laws passed at this session are fundamentally correct and will greatly improve marketing practices.

The Florida Citrus Fact Finding Institution being a permanent service organization is now engaged in gathering facts that will be invaluable to the citrus growers at the public hearing when called by the Florida Citrus Commission to promulgate rules and regulations controlling gas coloring room practices by shippers.

FRANK R. HAMMETT
Managing Trustee Florida Citrus
Fact Finding Institution

FURTHER LIGHT ON THE NATURE AND CAUSE OF PSOROSIS OF CITRUS TREES

(Continued from page 12)

and bark rot of citrus trees in the Phillipines. Phillipine Agr. Rev. 16: 219-225, 8 pls., 1923.

6. Swingle, W. T. and Webber, H. J. The principle diseases of citrus fruits in Florida. U. S. Dept. Ag., Div. Veg. Phys. and Path. Bull. 8, p 31, 1896.

FREE PUBLIC LIBRARY
JACKSONVILLE, FLORIDA

DISTRIBUTION OF FLORIDA CITRUS CROPS

(Continued from page 7)

as Texas crops became larger. As with oranges, newspapers, Sunday newspaper supplements, outdoor posters and car cards are also used for grapefruit.

This season's low grapefruit prices may cause many to unwittingly criticize the effectiveness of this year's campaign. A majority of the industry, however, take much gratification from the fact that such a large volume of grapefruit as was consumed by the American public could not have been moved without the existing combination of regulation and advertising. This season, unsatisfactory as it may have been, carried us a long way towards our eventual goal of widespread demand for grapefruit, and its benefits will be felt in succeeding seasons.

Now as to tangerines. It is commonly accepted that the tangerine is a non-competitive fruit because it is not produced in volume by the other citrus areas. I cannot entirely subscribe to this opinion, first, because tangerines are subject to all the competitive factors influencing oranges and grapefruit and, second, because they come into direct competition with oranges, particularly California Navels. Furthermore, it is a small, highly seasonal perishable crop. But paradoxical as it may seem, these are in my opinion the virtues that if properly merchandised and advertised, will make tangerines a very profitable crop. During the strawberry season, almost everyone eats strawberries. The same thing is true of the other berries, peaches, etc. These fruits move into the market in containers designed not only for protection against damage but also to provide ready-made sales units, and the appetite and buying appeal are instantaneous. I trust that shipping organizations will give serious thought to the principle I have brought out in the hope that this fruit can eventually be marketed more in keeping with its particular characteristics. This season's tangerine advertising was confined almost entirely to large national magazines, with a limited amount of newspaper space used in larger markets. Full page magazine ads in four colors emphasized the child appeal, the Christmas appeal, the extra calcium content and the all round goodness of this fruit and wholesalers and retailers all over the country reported excellent results from the campaign.

The advertising of canned citrus

(Continued on page 18)

Last Call

For Your Summer Fertilizer Application

NITROPHOSKA

TRADE MARK REG. U.S. PAT. OFF.

WILL DO THE JOB BEST AT THE LOWEST COST

Make your fertilizer dollar do the most effective work it has ever done—

APPLY

NITROPHOSKA

TRADE MARK REG. U.S. PAT. OFF.

NOW

JACKSON GRAIN COMPANY

State Distributors

Tampa Florida

ADVERTISEMENT — THE LYONS FERTILIZER CO.

The LYONIZER

Department

COMPILED BY THE LYONS FERTILIZER CO.

CONSUMERS HAVE A RIGHT TO QUALITY FRUIT

We believe that there has been a sincere effort made at the present session of the legislature to secure the passage of laws which would prevent the shipment of fruit which is unfit for the market.

We hope that this has been accomplished, for up to the present time no law has been able to keep fruit off the market which was so unpalatable as to create in the mind of the purchaser a marked antipathy towards Florida fruit early in the season.

But laws or no laws it is our considered opinion that every grower, shipper and everyone else in Florida affected by the relative prosperity of the citrus industry should exert every effort to see that fruit which leaves this state going to northern markets should be of such high quality as to instantly create in the minds of the consumers the desire to have more fruit of the same kind from the same source.

There is no short method to developing finest quality fruit.

The only method of achieving this purpose is to fertilize the trees with the proper sort of fertilizer, manufactured from the finest ingredients it is possible to obtain — ingredients which have proven their ability for many years to do the job well. Then the job of keeping the trees free from pests which are harmful to both trees and fruit must be carried on with the utmost vigilance.

When the majority of the fruit which leaves Florida for the market is high in quality, of fine texture and palatable to the taste, then one of the biggest handicaps of the citrus industry will be overcome.

Lyons Fertilizers will help immensely in accomplishing this purpose.

THE PRESENT shipping season is nearing a close, and, as we see it, there is little or no purpose in bemoaning the unfortunate happenings which marked the past season up to the time that Valencia oranges began to command reasonable prices in the market towards the close of the season.

The big job now of all of us who are citrus growers is to plan for the forthcoming crop and the next shipping season. This planning must be done with intelligence and the very definite purpose of taking advantage of every possible opportunity to reap a greater harvest of profits during the coming season than during the one just closing.

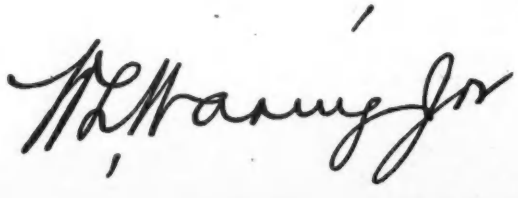
Dry weather has been responsible for a marked decrease in the crop prospect for early Duncan grapefruit, while the orange crop generally shows every indication of being considerably lighter than it was last year.

Recent rains have helped materially in bringing the trees out of the effects of the drouth and now, with proper care and feeding, the trees should be able to produce maximum quantities of the quality of fruit which is so much in demand in the market.

In spite of the strikes in some sections of our country and despite the continued talk of war and disturbances over seas the business barometer of the United States continues to rise with marked steadiness from week to week. So with prospect of a considerably lighter crop and with a consumer market which appears to be growing constantly brighter the outlook for the Florida citrus grower cannot fail to be much better than it was last season.

Under any conditions the demand for inferior fruit is virtually dead. Consumers are smart. They have been educated in the matter of the relative qualities of fruit. They will not pay anything but sacrifice prices for inferior fruit—indeed, they have about reached the point where they will not buy it at all.

So let us prepare for the coming season by making of it one that is outstanding, from the standpoint of the volume of Quality fruit produced. Grower and consumer will both profit by it.



JUNE SUGGESTIONS FOR GROVE CARE

Prepared by Horticultural Department, Lyons Fertilizer Company

Keep young trees hoed or cultivated, but discontinue cultivation of older trees if rainy season sets in.

SPRAYING

Watch rust mites closely. Scale insects and whiteflies may need attention this month, particularly in those groves that have been sprayed with Bordeaux mixture for melanose and scab control.

FERTILIZING

Fertilize at once if summer application has not already been applied.

COVER CROP

If cover crop has started do not cultivate after fertilizing. Plant crops at once where they are not already established.

PRUNING

Remove dead wood and water sprouts. Trees will make better growth if dead wood is not carried along. A clean cut will heal, while a dead snag is a chronic sore.

GENERAL

Set out missing trees. Clean out drainage ditches. This is the time for odd jobs and repairs.

Idle Fancies

An old man trying to make love to a sweetheart of his youth finds that it is like eating a warmed-over baked potato.

— — —

Every man should have some interest outside of his business.

— — —

Even if it is nothing more than shooting marbles like an Ozark "hill-billy" or playing poker like a Texas "longhorn."

— — —

It isn't the enthusiasm with which we start a thing but the determination with which we carry it out that counts.

NO SHORT CUTS TO TREE HEALTH

For many years the Citrus Experiment Station in Florida as well as in other states have studied intensively the effect of various ingredients upon citrus trees and other forms of plant life.

Modern fertilizers today are built upon the sound recommendations of the country's most expert horticulturists. Their results are certain and dependable. No short cut substitute for dependable fertilization has yet been found to build permanent tree health

A "radical" youth may become a "progressive" in maturity and a "conservative" in age.

Because these Products are Manufactured in Florida for use on Florida Groves

We Recommend

ORANGOL SPRAY EMULSION

OBRITE DUSTING SULPHUR

"SUPERIOR" WETTABLE SULPHUR

For control of citrus insects and disease

Maunfactured by

Orange Manufacturing Company
Orlando, Florida

Lyons Fertilizer Company
Distributors

Little Bits of FUN

TRUTHFUL ANSWER

"Won't you walk as far as the street car with me, Tommy?"

"No'm, I can't."

"Why not?"

"Cause we're gonna eat dinner soon's you're gone."

NEEDED PROTECTION

A man who ran for sheriff got 55 votes out of 3,500, and the next day he walked down Main Street with two guns hanging from his belt.

"You were not elected, and you have no right to carry guns," fellow-citizens told him.

"Listen, folks," he replied, "a man with no more friends than I've got in this county needs to carry guns."

A Kansas revival service was being held, according to authentic reports reaching us, and one of the partners in a coal concern had joined the church. He tried to get his partner to do likewise.

"I can't do it, John," replied the partner, when his insistence became irksome. "Who'll do the weighing if I join?"

ANALYSIS

Two Georgia darkeys were discussing the financial condition of the country. They didn't agree.

"You's all wrong," one vociferated. "Dey ain't no money sho't-age. Ah asked mah bankah is he out o' money and he tuk me in de vault an' showed me piles an' piles o' money. And ah says could he let me have a little. And he says he sho could. Has Ah any collat'rual? Ah hasn't. Now, dat's what's de mattuh wid dis country. Dey's plenty o' money, but we's just runnin sho't on collat'rual."

Judge: "Can't this case be settled out of court?"

Kelly: "Sure. That's what we were trying to do, your honor, when the policeman interfered."

DISTRIBUTION OF FLORIDA CITRUS CROPS

(Continued from page 15)

products has taken on a very important aspect. The indiscriminate canning of grapefruit juice in Texas has brought about a competitive condition that will require great effort to successfully combat. Our consumer campaign is confined almost entirely to magazines, and includes a full page four color advertisement in the July issue of Ladies' Home Journal in addition to innumerable black-and white ads in larger monthly and weekly magazines. A large color advertisement will also appear in the June 25th issue of the American weekly. These ads emphasize the superior quality of the Florida product and in a strong campaign in trade papers, this is especially stressed. The British Isles are becoming a very important market for canned grapefruit and we are strengthening our advertising campaign in the United Kingdom, using large daily newspapers and women's magazines.

In addition, a campaign to increase gift box sales in Florida was conducted in all leading Florida daily and weekly newspapers throughout the citrus and tourist areas.

Supplementing this basic advertising, the Commission put a great deal of activity into sales promotion work. publicity and scientific research. The sales promotion department, consisting of eleven experienced merchandising men, plus nine temporary men who operated during the National Citrus Sales, covers all important wholesale and retail outlets in northern markets for the purpose of winning the support of the trade, to distribute display material and erect displays, to educate owners and clerks regarding the superior qualities of Florida citrus fruits and to keep closely in touch with all marketing conditions. This activity has been increased from year to year in proportion to its developed effectiveness and economy.

A very important phase of our promotional work has to do with the National Citrus Sales. Since the inauguration of these sales on the occasion of the National Grapefruit Promotion two years ago, the entire citrus industry has had full benefit of the tremendous merchandising power of more than 200,000 organized retail food outlets of the United States, in the movement of burdensome surplusages. This group consists of the 37,000 units of the National Association of Food Chains, 153,000 retail members of the Independent Food Distributors Council, the 500 members of the Supermarket Institute, the 4,000 units of the National Association of Chain Drug Stores, and the 10,000 units of the Institute of Distribution and the Limited Price Variety Stores Association. These groups represent the outstanding retail outlets of the country and in the last three years have conducted eight seperate national sales in our behalf. Without these organized drives, our marketing problems would have indeed been multiplied. Closely allied with this movement is the relatively new National Citrus Merchandising Committee, composed of representatives of the four producing areas and all important trade factors. This committee, of which I am a member, meets at frequent intervals for the purpose of discussing and determining methods for the alleviation of distressing surplusages. A meeting is scheduled for next month, at which time plans will be developed for the movement of this season's cannery output.

Publicity activities center chiefly upon editorial mention on food pages of newspapers and magazines. Each season we receive millions of lines of editorial support in the form of photographs, articles, recipes, etc. In addition, by featuring citrus fruits in connection with well-known people and important or unusual events, we have gained a wide coverage of photographs in northern newspapers, and several news-reel features.

This season the Commission's Scientific Research program was considerably broadened to include not only a continuation of technological research now in its third year at Columbia University but also to provide for exhaustive research into the hitherto little known elements and vitamins in citrus fruits, under the direction of Professor H. C. Sherman, internationally known nutrition authority. Also, through the cooperation of the United States Bureau of Standards and the University of Maryland, an enttirely new phase of dental and mouth studies are being made. You have just seen a brief description of this work by Dr. Sterling V. Mead, who is supervising this activity. While research of this nature is slow and painstaking, I hope to be able to make an illuminating report on the entire subject by the end of the current season. The results of this work from year to year will serve as a sound foundation for continued professional and lay interest in the nutritional and medicinal properties of our fruits.

Of particular interest this year is our participation in the New York World's Fair. Florida National Exhibits, Inc., have erected one of the finest and largest exhibits at the Fair and citrus products will play a very important part. Chief among the citrus attractions will be a large grove under actual growing conditions, the largest citrus diorama ever made and a seventy-one foot Georgia marble juice bar with twenty attendants serving Florida orange juice, orange sherbet and canned grapefruit juice. The entire Fair represents an investment of $150,000,000 and Florida is indeed fortunate in being able to play so impressive a part in it. This season's attendance is estimated at 50,000,000 people and a large percentage will pass through our State exhibit.

Ladies and gentlemen, I could continue interminably giving you important and interesting details of the work that is being carried on in your behalf. Neither time nor good taste permit this. Permit me, however, to take just one more moment to point out the present status of citrus production in this country.

This season's United States production of oranges, grapefruit and tangerines totals 117,387,000 boxes

AIR CONDITIONED
67%
51%
JACKSONVILLE'S
LARGEST and
FINEST HOTEL
300 Rooms
300 Baths
The
ROOSEVELT
GARAGE
Directly Connected
With Lobby
JACKSONVILLE
FLORIDA
Charlie Griner Manager
Conveniently located in the downtown business, shopping and theater district. Every room an outside room (no court) with private bath, circulating ice water, radio, fan and bed reading lamp. Suites of parlor, bedroom and bath. Superior cuisine and service in The Patio Grill and The Rendezvous.
Our Lobby, Dining Rooms, Lounge, Beauty Parlor, Barber Shop and all public rooms are completely air conditioned. More than half of our Guest Rooms are individually air conditioned---no re-circulation of air from one guest room to another. This modern, hospital-approved system is an exclusive feature of The Roosevelt.
Drive your automobile into the Hotel Roosevelt Garage, which is directly connected with our Lobby.
All Outside Rooms - No Court
Circulating Ice Water
Tub and Shower
In Every Room
$2.00 UP
A Robert R. Meyer Hotel

FREE PUBLIC LIBRARY
JACKSONVILLE, FLORIDA

or an average of almost four full boxes of citrus for every family in the entire United States. Of this production, 41,000,000 boxes is grapefruit, against an average of 17,000,000 for the years 1927 to 1936. Certainly this is mass production. Faced with ever-increasing volume for the next few years, oranges and grapefruit will, I feel, eventually find themselves in the classification of staple commodities, items that sell in great volume at low cost. The struggle towards improved production, handling and transportation methods and lower costs must continue at an accelerated rate to preserve profit possibilities for ourselves and the trade. Moreover, the industry's program of advertising, promotion and publicity must be continued and where possible amplified and further perfected if Florida citrus is to maintain its rightful place in the Sun.

THE IMPORTANCE OF ORGANIC MATTER IN SOILS

(Continued from page 6)

non-leguminous plants do not fix as much carbon or humus in the soil as the leguminous plant materials. Then, there are those who plant legumes on acid soils and wonder why the crop fails. Most legumes require an abundance of lime and soils well supplied with lime are neutral in reaction or nearly so. Some legumes will tolerate more acidity than others but they will all do much better on soils well supplied with lime. To be of the greatest value as green manures, legumes should be inoculated. Uninoculated legumes are boarders. That is, they draw upon the soil for their nitrogen instead of the air.

The maintenance of soil organic matter by the use of artifical farm manure is not yet recommended on the general farm. However, there are many instances where the practice may prove profitable. The market gardener, the truck farmer, the greenhouse operator and perhaps the grove manager, especially those on sandy soils low in organic matter, may find composts of large value. Just when and where artificial farm manures may be used most profitably will depend upon local conditions, but it appears that the practice may have an important place in Florida agriculture.

PROGRAM COMPLIANCE CHECK-UP ON STATE'S FARMS BEGINS JUNE 1

A check-up of 42,000 Florida farms to determine extent of compliance with provisions of the 1939 agricultural conservation program will get under way about June 1, said R. S. Dennis, state AAA performance supervisor.

Preparatory to the beginning of the check-up, a series of meetings was held recently in various sections of the state to instruct county supervisors on methods of checking compliance with the program provisions.

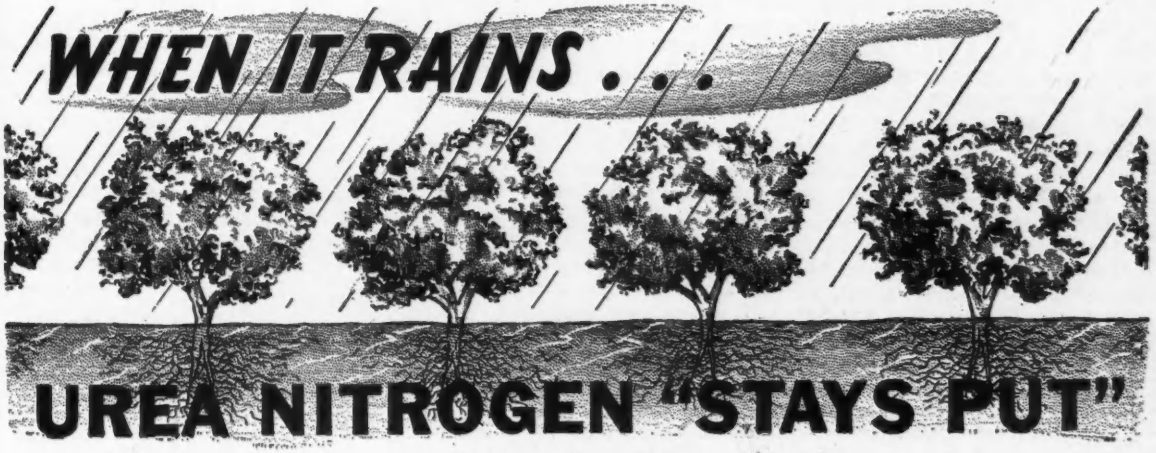
Approximately 95 percent of Florida's farm land is included in the program this year, Mr. Dennis explained.

Farms will be checked to determine acreage in soil-depleting crops, the acreage where soil-building practices have been carried out, the kinds of soil-building practices, and other details. Cooperating farmers are paid on the basis of compliance.

The major part of the check-up will be concluded by early August, but other work along this line will be done in the Fall to determine extent of late soil-building practices, Mr. Dennis said.

COOKING DRIED FRUIT

Wash fruit thoroughly, cover with cold water, let soak for several hours or overnight, simmer gently (in water in which soaked) until just tender, add sugar to taste.



UREA NITROGEN "STAYS PUT"

(Resists Leaching)

Urea Nitrogen goes to work quickly...and keeps working whether the season is wet or dry!

NITROGEN applied as UREA, while completely available, combines with the soil to prevent leaching, and therefore is an exceptionally satisfactory form to use in summer, when heavy rains are expected.

In leaching tests at the Florida Agricultural Experiment Station*, including several forms of nitrogen, UREA was found to be very resistant to leaching.

With Norfolk sand, typical Ridge citrus soil, nitrogen applied as UREA compared favorably with that of high-grade natural organics in its resistance to leaching.

"URAMON" is an attractive form of urea nitrogen that is used in mixtures or for direct application.

**Nels Benson and R. M. Barnette, in Journal of the Amer. Society of Agronomy, Jan. '39. Reprints on request.*

"Uramon" Fertilizer Compound
Reg. U. S. Pat. Off.
(42% Urea Nitrogen)

• • •

Urea-Ammonia Liquor
(20% Urea Nitrogen. 25% Ammonia Nitrogen)

DU PONT
REG. U.S. PAT. OFF.

E. I. DU PONT DE NEMOURS & CO., INC. . . . Ammonia Department . . . Wilmington, Delaware

FACTORS IN DIAGNOSING CITRUS GROVE CONDITIONS

(Continued from page 8)

fixation.

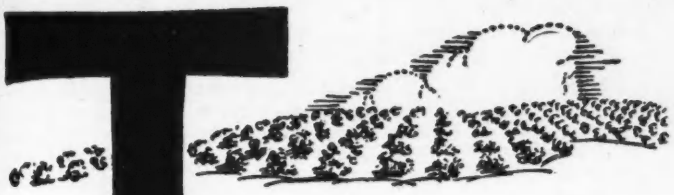
With this background of history, combined with tree and soil information, we can take a few typical cases to show how our technical information can be utilized in making grove diagnoses preparatory to our summer application of fertilizer. The four groves to be considered are typical cases which are common throughout the citrus belt.

Grove No. 1, examined in May. This is a 20 year old grove of seedy grapefruit on rough lemon stock; the soil is a very light sand, probably blackjack land; production has been declining for several years with many culls and few first grade fruits and the trees alternating in production, with crop in the past season very light; fertilization has consisted mainly of inorganic acid mixtures usually composed of sulfate of ammonia, acid phosphate, and muriate of potash, 4-8-6 in the spring and summer and 3-8-8 in the fall and the amounts per tree have been liberal; no corrective materials have been used. All soil pH determinations for the last three or four years have been below pH 5.0. The grove has never been sprayed with a copper spray. An examination of the grove shows no bronzing but some evidence of dieback; a few fruits showed ammoniation; the crop was very light as it was evidently the off year; some frenching was observed but no manganese deficiency symptoms. There was considerable dead wood left over from the previous year in the shape of small dead twigs that has evidently borne fruit in the previous year. Soil pH 4.6, soil very light, no clay within six feet. Putting the above information together we get a picture about as follows: Blackjack sand at a pH of 4.6 and an inorganic N-P-K fertilization program means that the soil is very low in all nutrient bases, probably around 250 pounds of calcium, less than 15 pounds of magnesium, less than 25 pounds of potassium, and less than 2 pounds each per acre of zinc, manganese, and copper. Trees consequently deficient in all nutrients and particularly in copper, zinc, manganese and magnesium; and magnesium deficiency is not evident in the form of yellow leaves because of the small crop due to the off year and the presence of copper deficiency which further curtailed the crop; manganese deficiency is masked by zinc deficiency symptoms. Fertilization at present pH is uneconomical because of leaching and pH should be raised by means of basic materials (dolomite, basic slag, or lime) before applying further fertilizer. A copper, zinc, manganese spray should be applied immediately to improve tree condition and help set a crop, or zinc should be applied as a spray and copper and manganese to the soil. Soluble magnesium should be applied either in the fertilizer or separately at 200 to 300 pounds per acre to give the trees a reserve of magnesium until dolomite becomes available if the latter is used. Some bulky organic materials should be used in the fertilizer to supply any elements that may be needed in small traces but which are not identified at the present time.

Grove No. 2, examined May 1. Pineapple orange trees on rough lemon stock, 18 years old, medium sandy soil that was probably high pine land; has been an excellent producer but for last three years has been falling off slightly in quantity of fruit and very definitely in quality with some ammoniation reported by packing house manager. Fertilizer program has been high organic with most of the phosphorus from bonemeal and remainder of nitrogen from sulfate of ammonia. The soil is fairly high in organic matter, clay about three feet from surface and pH between 5.9 and 6.2 for several years. An examination of the trees shows very vigorous growth and very little in the way of growth symptoms indicative of copper deficiency, but while the crop has been picked, a few drops left under the trees have ammoniation markings on them. There is a slight amount of frenching and no magnesium deficiency symptoms in spite of a fairly heavy crop that has just been moved. The pH of the soil is 5.94. Putting all of this information together to form a composite picture we find that the soil is about as high in calcium as it could well be maintained, potash high but magnesium which has been derived mainly from the bonemeal is just enough to take care of a medium-sized crop, manganese reasonably high. No radical change in fertilizer practice to be recommended, the decline in fruit quality being due to the gradual removal of copper and zinc in the crops and the addition of these being indicated. A copper-zinc spray followed by copper in the fertilizer will take care of the situation. A large new crop is set, and some soluble magnesium should be added to the summer application of fertilizer.

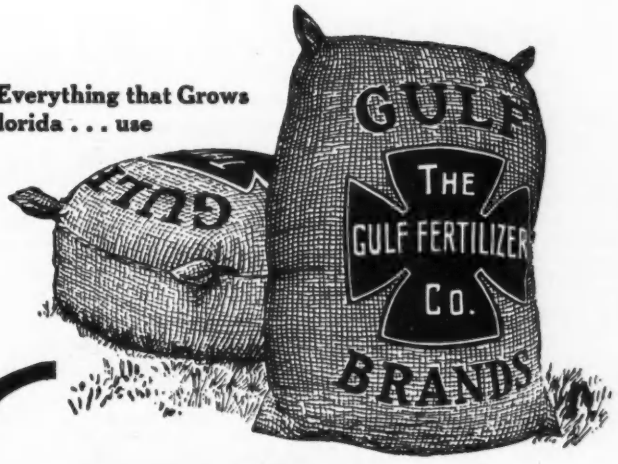
Grove No. 3, examined in May. Valencia grove on high pine land, rough lemon stock, about 20 years old. Crops have been declining rapidly for two years with many very large and pithy fruits and very few first and second grade fruits. Fertilization for three years heavy to inorganic nitrogen, some potash, little phosphate, copper sprays have been used but no zinc, manganese or magnesium. Soil fairly good sand, pH last year 6.5, previous year 6.2, and four years ago was about 4.8; rise in pH due to heavy liming. Examination of the grove shows very light crop, mostly large sizes, but a few small fruits, 288's and smaller on periphery of tree, no ammoniation, acute case of frenching and a suggestion of manganese deficiency but mostly masked by zinc deficiency; growth in center of tree heavy with large leaves and long shoots but growth in periphery frenched. Bronzing more severe than would be expected from the size of the crop. Soil examination shows a pH of 7.3 and considerable free lime. Evaluating all of this we would arrive at the following conclusions: The calcium in the soil is high, potash reasonably high, magnesium is low since the soil previously had a pH of about 4.6 and no magnesium has been applied. Extreme symptoms of magnesium deficiency probably are induced by failure to raise the level of magnesium when the calcium was raised through additions of lime, thus making magnesium deficiency more acute. Zinc and manganese are fixed by excess carbonates but manganese deficiency in this case is largely masked by zinc deficiency. An application of a zinc spray as soon as the crop has been moved is indicated as the first step in recovery, together with this manganese can be applied as a spray or in the fertilizer and soluble magnesium should be applied liberally in the fertilizer (300-500 pounds per acre) and also some copper unless the grove is sprayed with copper. The high pH and the excess of carbonates will make a yearly zinc spray a necessity if the grove is to be kept in good condition and manganese also will have to be used liberally until the pH falls below 7.0. Use an acid fertilizer with a liberal amount of phosphoric acid; and because of the failure to apply any organic nitrogen for several years, add as much of these as economically possible, and use those that are acid forming as tankage and castor pomace.

Grove No. 4, examined in May. Marsh Seedless grapefruit on sour stock, ten years old, located on coastal hammock soil underlaid by marl which was mixed in the ridges so that previous determinations of pH have given values around 8.0. Grove



THE summer application of fertilizer in your grove has a double duty to perform. It must aid in perfecting quality, size and maturity of fruit. At the same time, it must give trees substance for new growth, a vital factor in both this year's and next year's crops. Certainly it would be false economy to use any fertilizer which failed to provide for the needs of the crop on your trees and crops to come. The Gulf Field Man in your section will recommend a program suited to the particular needs of your grove — and you'll find that GULF high-Quality Friendly Fertilizers save you money in the long run.

For Everything that Grows in Florida . . . use



GULF Brands of FERTILIZER

Friendly Fertilizers Keyed to Your Soil

Gulf Distributors and Gulf Field Men are located at convenient points throughout Florida. Or write us direct if you want special information.

THE GULF FERTILIZER COMPANY

36th Street, South of East Broadway, Tampa , Florida

East Coast Factory — PORT EVERGLADES, Florida

has not come into satisfactory production, fruit irregular in shape, and trees thin. Two applications of fertilizer per year made up on acid formulae but containing no manganese have been used. Copper has been used yearly as a spray. Owner reports marl frenching, but has done nothing about it. An examination of the grove reveals trees that have grown quite vigorously but irregularly and the leaves show typical marl chlorosis, the older leaves having a dull-whitish-green cast. The pH of the soil is 7.85 and the drainage good. This represents a comparatively simple case, the marl in the ridges has fixed both zinc and manganese bringing on a marked deficiency of both but with manganese deficiency being the primary factor. Copper is probably deficient in the soil but has been applied in sprays. An immediate spray with zinc and manganese is indicated; and both will have to be included in the yearly program, zinc as a spray and manganese either as a spray or a heavy soil treatment. The fertilizer program can be continued with these additions.

Much of the difficulty in setting up nutritional programs for citrus groves is due to a failure to utilize the information that is available, there being a tendency to turn to new ideas before the available information is digested and put to use. A knowledge of the history of a grove, an understanding of a few fundamental facts involved in soil and fertility problems, together with a knowledge of the symptoms exhibited by the trees, will, if applied logically, give a reasonably accurate picture of grove needs. Less time spent in seeking panaceas for grove culture and more time spent in studying the grove itself and becoming acquainted with its behavior will help to solve many of the problems. There is an old saying to the effect that the footsteps of the owner are the best fertilizer and there is still a wealth of truth in that saying.

CONTROL MEASURES FOR MEALYBUGS

(Continued from page 9)

demic of a fungus disease has invariably come to the aid of the growers in the control of mealybugs, but mealybugs are apt to increase again in the fall after the heavy rains of summer have ceased, and this fungus does not develop well at that season. Mealybugs killed by this fungus are darker in color than healthy ones and of such a consistency as to be cut with a sharp knife like a piece of cheese.

GROWERS SHOULD TAKE PROMPT MEASURE TO CONTROL RUST MITES

Warm, dry weather that ordinarily prevails in Florida during May and early June is ideal for the spread of rust mites and growers must take prompt measures to control them if they are to prevent their citrus trees from being damaged, according to J. R. Watson, State Experiment Station entomologist.

A fungus disease that thrives in the rainy season will usually control these pests very well in July and August, but the dry period of six to eight weeks before the daily rains begin requires artifical control measures, Mr. Watson says.

As each female lays an average of 500 eggs and as females become mature within a week to 10 days, rust mites spread very rapidly when they are favored with weather conditions.

The insects appear first on leaves and twigs, moving to young fruit when it becomes about an inch in diameter. While there is little definite information on just how much damage they do to leaves and twigs, the damage they do to young fruit is very definitely known. When they attack young fruit they cause a mottled discoloration on the thin epidermis which breaks up into small. rough, crescent-shaped specks. When they attack somewhat larger fruit, the discoloration of the rind is smoother and more even.

When rust mites are discovered, prompt control measures should be taken against them. Dusting is preferred over spraying by some growers, although spraying is being practiced by an increasing number of grove owners. A satisfactory dust is made by mixing from five to 10 pounds of hydrated lime with 90 to 95 pounds of sulphur dust. A spray which will also tend to control scale insects and whitefly is made by mixing two or three quarts of lime-sulphur to 50 gallons of water and adding from to to five pounds of wettable sulphur to this mixture.

FARMERS OF FLORIDA RECEIVE $1,353,000 FOR SOIL PRACTICES

Farmers of Florida received assistance totaling $1,353,000 for carrying out soil-building practices on their farms under the 1938 Agricultural Conservation Program, according to H. G. Clayton, State Administrative Officer of the AAA.

Clayton says many Florida farmers carried out approved soil-building practices, such as terracing, liming, establishing permanent pastures, strip-cropping, seeding legumes, and planting forest trees. Similar assistance is available to farmers under the 1939 farm program.

"I sincerely hope that every farmer of the State this year will get the maximum good from this assistance by using it for bearing a part of the cash cost of the soil-building practices needed on his farm, thereby doing his part in the protecting and restoring the fertility of our soil," he says.

The assistance is not, in itself, a reward for the conservation accomplished. It simply provides a means by which farmers can get soil-building done that they could not otherwise do. The real reward to the farmer is in the form of improved land and more efficient production.

In the nine States of the Southern Region a total of about $22,603,000 was earned under the 1938 farm program by about 2,500,000 farmers who carried out needed soil-building practices.

CLASSIFIED

Advertisments

The rate for advertisements of this nature is only five cents per word for each insertion. You may count the number of words you have, multiply it by five, and you will have the cost of the advertisement for one insertion. Multiply this by the total number of insertions desired and you will have the total cost. This rate is so low that we cannot charge classified accounts, and would, therefore, appreciate a remittance with order. No advertisement accepted for less than 50 cents.

SUMMER SALE PRICES ON CITRUS TREES NOW IN EFFECT
And now is a good time to plant.
½" caliper @ 30c
⅝" caliper @ 35c
¾" caliper @ 40c
1" caliper @ 50c
Prices are for lots of 100 or more trees. Add 10c each on small orders. Have most all standard varieties of Oranges, Grapefruit, Tangerines, on Rough Lemon and Sour Orange stocks.
LAKE GARFIELD NURSERIES CO.
BARTOW, FLA.

MANURE — Stable and Dairy Manure in car lots. Write for prices. P. O. Box 2022, Jacksonville, Fla.

MANGO HARVEST BEGINS SOON

The harvest of the Lee County mango crop, which will get under way about May 20, is expected to be a heavy one, according to County Agent C. P. Heuck. Dry weather during the blooming period prevented anthracnose infection of young fruit and thus insured a heavy crop, Mr. Heuck says.

CITRUS BUDS AND SEEDLINGS— Jaffa, Pineapple, Hamlin buds on Sour Stock. Sour Orange Seedlings.. R. P. Thornton and H. S. Pollard, Copothorn Nurseries, Box 2880, Tampa, Florida.

CITRUS SEEDLINGS
Cleopatra, Sweet Seedlings, Sour Orange, Rough Lemon, Grapefruit. New low prices. Grand Island Nurseries, Eustis, Fla.

SOAR'S SWEET — Ripens 20 to 30 days ahead of other oranges, more juice, better flavor. Order trees NOW. Pomona Nurseries, R 2, Dade City, Florida.

ALYCE CLOVER
Fresh crop, cleaned, and inoculated. Also Crotalaria Spectabilis, Intermedia, Striata. Write for new low prices. Grand Island Nurseries, Eustis, Fla.

CROTALARIA SPECTABILIS and Hay Peas. Write for our prices. We also have a full and complete line of all farm seeds. Robinson's Seed Warehouse, Cairo, Georgia.

ALYCE CLOVER SEED. Ripe and cleaned. Ideal cover and hay crop, Write for information. P. E. Synder, Box 866, Lakeland, Fla.

CROTALARIA SPECTABILIS — Fresh crop, $15.00 per 100 lbs. f. o. b. Frostproof, Fla. Milton Woodley, Frostproof, Fla.

CHOICE Rough Lemon Seedlings 6 to 20 inches high, $10.00 per thousand. Olan Altman, Sebring, Florida.

"MAIL ORDER Operator desires contact with grower of high grade avocado pears. Have interesting proposition for grower of highest quality fruit." F. R. Gardner, P. O. Box 528, Greenville, Pa.

AVOCADOS — All desirable varieties. Haden Mangos, Persian Limes, superior budded Loquats. Coral Reef Nurseries Co., Homestead, Florida.

CITRUS NURSERY TREES
All standard varieties and novelties, on Cleopatra and Sour Orange root. Grand Island Nurseries, Eustis, Fla.

STANDARD Varieties of citrus trees including Persian limes and Perrine lemons at reasonable prices. Ward's Nursery, Avon Park, Fla.

JACKSONVILLE, FLORIDA

The Citrus Industry

with which is merged The Citrus Leaf
Exclusive publication of the Citrus Growers and Shippers

Publication office 550 North Broadway, Bartow, Florida
Telephone ——— 289

Published Monthly by
ASSOCIATED PUBLICATIONS CORPORATION
S. L. FRISBIE - - - - - - - - President
S. LLOYD FRISBIE - - - - - Secretary-Treasurer
A. G. MANN - - - - - - - Production Manager

Subscription, $1.00 per year in advance

DO IT NOW

About the most sensible suggestion we have seen recently in connection with the present citrus situation is contained in an interview by R. M. Clewis, president of the Hillsborough county unit of Florida Citrus Growers Inc., printed in the Tampa Morning Tribune.

After reviewing the citrus situation in recent years and comparing the prices now received by the growers with those of former years. Mr. Clewis calls upon growers and shippers to lose no time in getting together to formulate a program for the approaching season. The Citrus Industry is particularly pleased with Mr. Clewis' suggestion because it is right in line with what this publication has been urging for the past several years.

Heretofore, efforts to formulate a citrus program have been delayed until October or November, after the shipping season was well under way and after material harm had been done by indiscriminate early shipments, much of which was of inferior quality, and after major markets had been flooded, with consequent reduction in price.

It is only two months now until the shipping season will be opened. It will require all of that two months, and if we are to judge by past experience probably much more than two months, to formulate and put into effect any marketing or other program which may be desired by the growers.

Pointing out that since the 1928-29 season orange production has increased from thirty-three million boxes to seventy-two and one-half million boxes, and that the returns to Florida growers has declined from $20,000,000 in the 1928-29 season to $8,000,000 for the 1938-39 season, and that grapefruit production has increased from 11 million boxes to 41 million boxes during the same ten years, while the growers received one-fifth as much for the 1938-39 crop as for the crop of 1928-29, Mr. Clewis urges immediate action to meet the present crisis.

Calling attention to recent legislation enacted at the insistence of the growers, Mr. Clewis urges that prompt steps be taken to insure the strict enforcement of the newly enacted measures.

Speaking as a grower and for other growers, Mr. Clewis says:

"Last year the first industry meeting was called in October — too late to formulate and put a program into effect. This year the growers insist that an industry meeting be called at once in order that the complete plan may be made and ample time provided for the industry to adjust themselves to it.

"We feel sure that many things can be done, such as a sensible elimination of surplus, orderly marketing, consolidation or coordination of selling organizations so that price cutting practices to induce volume are eliminated. The grower demands only that work on a well rounded plan be started immediately."

If any worthwhile citrus program is to be put into effect in time to benefit the grower in the approaching season, it is high time that steps toward such a program be undertaken at once. The fact that previous efforts at establishing a citrus program in Florida have proved abortive is due in large measure to the fact that nothing has been done until the season was well underway. With the citrus situation as it is in Florida, divergent interests within the industry are bound to hold conflicting views. These conflicting views cannot be harmonized and a workable program formulated in a day, a week or a month. That is one fact which past experience has clearly established. Then, too, after a program has been agreed upon by the industry itself, federal or state enforcing agencies will require time to put the program into effect.

Whatever is to be done, and most factors within the industry whether growers or shippers agree that something should be done, must be done at once if the industry is not to go through the same experience as last year or the year before. No matter how good a program may be worked out, it will be worthless if it is not put into effect until mid-season or later. The time to act is now.

A CITRUS HABIT

Wherever citrus fruits are grown, there appears to be two (or more) schools of thought. In no given citrus growing section, it appears, can the growers agree upon a settled plan of action or a workable program of control. Perusal of citrus publications in Texas, Palestine, South Africa and Brazil emphasizes this divergence of policy. Even in California, frequently cited as the acme of perfection in citrus organization, there appears to be this same element of discord, though possibly in less pronounced degree.

Texas growers just now appear to be even more seriously divided on the question of a citrus program than are the growers of Florida. For the welfare of the industry everywhere, it is to be hoped that a speedy adjustment of grower differences may be brought about. It would be a happy circumstance if Florida growers might lead the way.

Next to plant food, the most essential need of your grove is protection against insect pests and disease.

There is nothing prettier than a well-kept citrus grove — and nothing much uglier than a neglected one.

"Emergencies" in the citrus industry should be met before the fruit is sold — not after the cars begin to roll.